

IN THE CLAIMS

40. (Previously Amended) A method comprising:
iteratively processing a signal through a plurality of signal processing procedures to generate a plurality of processed signals; and
sequentially transmitting the plurality of processed signals through a coupled antenna array, generating a desired radiation level at a number of locations within a desired sector.
41. (Previously Amended) A method according to claim 40, wherein the signal is transmitted using a CDMA protocol.
42. (Previously Added) A method according to claim 40, wherein the desirable radiation level is a non-null level.
43. (Previously Amended) A method according to claim 40, wherein the desired sector is comprised of a range of azimuths up to a complete range of azimuths of the antenna array.
44. (Previously Amended) A method according to claim 40, further comprising developing a plurality of signal processing procedures comprising:
selecting a weight vector from a sequence of different weight vectors, wherein elements of the weight vectors selectively modify one or more characteristics of transmission of the signal from each antenna in the antenna array.
45. (Previously Added) A method according to claim 44, wherein the transmission characteristics include one or more of signal amplitude and/or phase.
46. (Previously Added) A method according to claim 45, wherein the sequence of weight vectors share an amplitude value and have random phase values.

47. (Previously Added) A method according to claim 45, wherein the sequence of weight vectors is comprised of weight vectors that are orthogonal.

48. (Previously Added) A method according to claim 47, wherein the orthogonal weight vectors have elements with the same magnitude.

49. (Previously Added) A method according to claim 47, wherein the orthogonal weight vectors are developed from one or more of rows or columns of a complex valued Walsh-Hadamard matrix, rows or columns of a real valued Hadamard matrix, and/or a sequence whose elements are basis vectors of a Fourier transform.

50. (Previously Amended) A method according to claim 45, wherein the sequence of weight vectors is comprised of weight vectors designed to provide a desirable radiation pattern within at least a sub-sector of the desired sector.

51. (Previously Added) A method according to claim 50, wherein the desirable radiation pattern is a near omni-directional radiation pattern.

52. (Previously Amended) A method according to claim 50, wherein the desired sector is the whole range in azimuth.

53. (Previously Amended) A method according to claim 45, wherein the sequence of weight vectors includes weight vectors that are representative of weight vectors designed for transmission to known communication unit(s).

54. (Previously Amended) A method according to claim 53, wherein the weight vectors designed for transmission to known communication unit(s) are determined from spatial signature(s) associated with each of the communication unit(s).

55. (Previously Added) A method according to claim 45, wherein the weight vectors are determined from weight vectors designed for transmission to known subscriber unit(s) using a vector quantization clustering process.

56. (Previously Added) A method according to claim 55, the vector quantization clustering process comprising:

assigning an initial set of weight vectors as a current set of representative weight vectors;
combining each designed for subscriber unit weight vector with its nearest representative weight vector in the current set, according to some association criterion;

determining an average measure of a distance between each representative weight vector in the current set and all weight vectors combined with that representative weight vector;

replacing each representative weight vector in the current set with a core weight vector for all the weight vectors that have been combined with that representative weight vector; and

iterative repeating the combining, determining and replacing steps until a magnitude of the difference between the average measure in a present iteration and the average distance in the previous iteration is less than a threshold.

57. (Previously Amended) A method according to claim 40, wherein the plurality of signal processing procedures is commensurate with the plurality of antennae within the antenna array used to sequentially transmit the plurality of processed signals.

58. (Previously Added) A storage medium comprising content which, when executed by an accessing machine, implements a method according to claim 40.

59. (Previously Added) A wireless communication system element comprising:
a storage medium including content; and

a processor element, coupled with the storage medium, to execute at least a subset of the content to implement a method according to claim 40.

60. (Previously Amended) A subscriber unit comprising:
two or more antenna configured as an antenna array; and
processing element(s), coupled with the antenna array, to iteratively process a signal through a plurality of signal processing procedures to generate a plurality of processed signals which, when sequentially transmitted via the antenna array, generate a desired radiation level at a number of locations within a desired sector.

61. (Previously Added) A subscriber unit according to claim 60, wherein the processing element(s) are comprised of one or more of an application specific integrated circuit (ASIC), a digital signal processor (DSP), a field-programmable logic array (FPGA) and/or a microcontroller resident within the subscriber unit.

62. (Previously Amended) A subscriber unit according to claim 60, further comprising:
a transceiver, coupled with the antenna array and the processor element(s), to sequentially transmit each of the generated plurality of processed signals to achieve the desired radiation level at a number of locations in the desired sector during at least one of said sequential transmissions, wherein sequential transmission of the generated plurality of processed signals comprises a broadcast transmission.

63. (Previously Added) A subscriber unit according to claim 62, wherein the processor element(s) are integrated within the transceiver.

64. (Previously Added) A subscriber unit according to claim 63, wherein the transceiver comprises at least one processor element for each antenna within the antenna array.

65. (Previously Added) A subscriber unit according to claim 60, wherein the processor element(s) select a radiation level that is a non-null level.
66. (Previously Added) A subscriber unit according to claim 60, wherein the desired sector is comprised of a range of azimuths up to a complete range of azimuths of the antenna array.
67. (Previously Added) A subscriber unit according to claim 66, wherein the processor element(s) select a weight vector from a sequence of different weight vectors to develop the processing procedure, wherein elements of the weight vectors selectively modify one or more characteristics of transmission of the signal from each antenna in the antenna array.
68. (Previously Added) A subscriber unit according to claim 67, wherein the transmission characteristics include one or more of a signal amplitude and/or phase.
69. (Previously Added) A subscriber unit according to claim 67, wherein the sequence of weight vectors share an amplitude value and have random phase values.
70. (Previously Added) A subscriber unit according to claim 67, wherein the sequence of weight vectors are comprised of weight vectors which are orthogonal to one another.
71. (Previously Added) A subscriber unit according to claim 70, wherein the orthogonal weight vectors share a common magnitude.
72. (Previously Added) A subscriber unit according to claim 70, wherein the processor element(s) develop the orthogonal weight vectors from one or more of rows or columns of a complex valued Walsh-Hadamard matrix, rows or columns of a real valued Hadamard matrix, and/or a sequence whose elements are basis vectors of a Fourier transform.

73. (Previously Added) A subscriber unit according to claim 67, wherein the sequence of weight vectors is comprised of weight vectors designed to provide a desirable radiation pattern within at least a sub-sector of an overall desired sector.

74. (Previously Added) A subscriber unit according to claim 73, wherein the processor element(s) develop the sequence of weight vectors designed to provide a desirable radiation pattern based, at least in part, on information associated with known communication station(s) in the desired sector.

75. (Previously Added) A subscriber unit according to claim 74, wherein the processor elements develop the sequence of weight vectors from spatial signature(s) associated with the known communication station(s).

76. (Previously Added) A subscriber unit according to claim 74, wherein the processor element(s) develop the sequence of weight vectors using a vector quantization clustering process.

77. (Previously Added) A subscriber unit according to claim 70, wherein the processor element(s) develop a plurality of signal processing procedures commensurate with the plurality of antennae comprising the antenna array.

78. (Previously Amended) A communication station comprising:
two or more antenna configured as an antenna array; and
processing element(s), coupled with the antenna array, to iteratively process a signal through a plurality of signal processing procedures to generate a plurality of processed signals which, when sequentially transmitted via the antenna array, generate a desired radiation level at a number of locations within a desired sector.

79. (Previously Added) A communication station according to claim 78, wherein the processing element(s) are comprised of one or more of an application specific integrated circuit (ASIC), a digital signal processor (DSP), a field-programmable logic array (FPGA) and/or a microcontroller resident within the communication station.

80. (Previously Amended) A communication station according to claim 78, further comprising:

one or more transceivers, coupled with the antenna array and the processor element(s), to sequentially transmit each of the generated plurality of processed signals to achieve the desired radiation level at a number of locations in the desired sector during at least one of said sequential transmissions, wherein sequential transmission of the generated plurality of processed signals comprises a broadcast transmission.

81. (Previously Added) A communication station according to claim 80, wherein the processor element(s) are integrated within one or more of the transceiver(s).

82. (Previously Added) A communication station according to claim 80, wherein the transceiver comprises at least one processor element for each antenna within the antenna array.

83. (Previously Added) A communication station according to claim 78, wherein the desired sector is comprised of a range of azimuths up to a complete range of azimuths of the antenna array.

84. (Previously Added) A communication station according to claim 78, wherein the processor element(s) select a weight vector from a sequence of different weight vectors to develop the processing procedure, wherein elements of the weight vectors selectively modify one or more characteristics of transmission of the signal from each antenna in the antenna array.

85. (Previously Added) A communication station according to claim 84, wherein the transmission characteristics include one or more of a signal amplitude and/or phase.

86. (Previously Added) A communication station according to claim 84, wherein the sequence of weight vectors share an amplitude value and have random phase values.

87. (Previously Added) A communication station according to claim 84, wherein the sequence of weight vectors are comprised of weight vectors which are orthogonal to one another.

88. (Previously Added) A communication station according to claim 87, wherein the processor element(s) develop the orthogonal weight vectors from one or more of rows or columns of a complex valued Walsh-Hadamard matrix, rows or columns of a real valued Hadamard matrix, and/or a sequence whose elements are basis vectors of a Fourier transform.

89. (Previously Added) A communication station according to claim 84, wherein the sequence of weight vectors is comprised of weight vectors designed to provide a desirable radiation pattern within at least a sub-sector of an overall desired sector.

90. (Previously Added) A communication station according to claim 89, wherein the processor element(s) develop the sequence of weight vectors designed to provide a desirable radiation pattern based, at least in part, on information associated with known subscriber unit(s) in the desired sector.

91. (Previously Added) A communication station according to claim 90, wherein the processor elements develop the sequence of weight vectors from spatial signature(s) associated with the known subscriber unit(s).

92. (Previously Added) A communication station according to claim 90, wherein the processor element(s) develop the sequence of weight vectors using a vector quantization clustering process.

93. (Previously Added) A communication station according to claim 92, wherein performing the vector quantization cluster process, the processor element(s):

assign an initial set of weight vectors as a current set of representative weight vectors;

combine each designed for subscriber unit weight vector with its nearest representative weight vector in the current set, according to some association criterion;

determine an average measure of a distance between each representative weight vector in the current set and all weight vectors combined with that representative weight vector;

replace each representative weight vector in the current set with a core weight vector for all the weight vectors that have been combined with that representative weight vector; and

iteratively repeat the combining, determining and replacing elements until a magnitude of the difference between the average measure in a present iteration and the average distance in the previous iteration is less than a threshold.

94. (Previously Added) A communication station according to claim 78, wherein the processor element(s) develop a plurality of signal processing procedures commensurate with the plurality of antennae comprising the antenna array.

95. (Previously Added) A method according to claim 53 wherein the communication unit(s) is at least one of a subscriber unit and a base station.

96. (Previously Added) A subscriber unit according to claim 60 wherein the signal is transmitted using a CDMA protocol.

97. (Previously Amended) A communication station according to claim 78 wherein the signal is transmitted using a CDMA protocol.